



5-7-04

#200 DAC
RECEIVED - Rem

MAY 12 2004

OFFICE OF PATENT & TRADEMARKS

Approved for use through 07/31/2006. GMB-0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMITTAL FORM (to be used for all correspondence after initial filing)	Application Number	09/871383	
	Filing Date	05.31.2001	
	First Named Inventor	Edlin Solomon	
	Art Unit	2815	
	Examiner Name	Joseph Nguyen	
Total Number of Pages in This Submission	55	Attorney Docket Number	

ENCLOSURES (Check all that apply)		
<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input checked="" type="checkbox"/> Amendment/Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation <input type="checkbox"/> Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input checked="" type="checkbox"/> CD, Number of CD(s) <u>N5</u>	<input type="checkbox"/> After Allowance communication to Group <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below):
Remarks Reply to decision on the petition		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	Edlin Solomon
Signature	<i>Edlin Solomon</i>
Date	05.03.2004

CERTIFICATE OF TRANSMISSION/MAILING			
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below. <i>express mail</i>			
Typed or printed name	Edlin Solomon		
Signature	<i>Edlin Solomon</i>	Date	05.03.2004

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



Examiner -- Joseph Nguyen
Applicant -- Edlin Solomon
Reply mailed 05.03.2004.
Application 09/871,383(20020089000-A1).
Art unit 2815.Mailing date 9.27.2002.

Reply No.8 to Notice received on 10.18.2002.

H01L 29/06

H01L 29/70

BIDIRECTIONAL BIPOLAR STATIC INDUCTION DEVICE

"paragraph 0001". The invention relates to microelectronics and more particularly to bidirectional bipolar static induction devices -- transistor and transistor-thyristor (transistor, which can be latched) with elements of a control circuit. Any device, according to the present invention can be latched. However, if a thick channel drain electrode have been connected to an ordinary channel drain electrode and if the latch current of the device exceeds the maximum current, such device can be considered as the device without latching, i.e. the transistor.

background of the invention

"between paragraph 0001 and 0002". There exists a static induction type semiconductor device is used as a power transistor. It is of the surface gate type and is used for providing a high current density. The static induction type semiconductor device provides a plurality of a small source regions surrounded by a gate region. According to this structure the channel region beneath the source region becomes small, thereby increasing the stored carrier density and enabling a large main current to flow when using a small gate current, thereby achieving a high current amplification ratio. A thin insulating film provided on the surface of the n⁺-source region operates as a tunnel-oxidized film, thereby enabling electrons to be injected into the source region but preventing the positive holes from being drawn out. Therefore, as the consumption of positive holes store in the channel region decreases, a sufficiently large source current is allowed to flow even if a further smaller gate current is injected, thereby further increasing the current amplification factor[1]. The drawbacks of the transistor are that it cannot operate on circuits of alternating voltage and that the current density is insufficient.

There exists a vertical JFET, in which a gate and a channel are formed by the implantation of an impurity in a doped epitaxial layer through mask - a doped polysilicon drain electrode[2]. The method provides forming of the transistor with channel thickness equal about 10.^{sup}-7 m. The drawback of the transistor is that it cannot operate on alternating voltage circuits.

"paragraph 0002". There exists a bipolar static induction transistor comprising elements of a bipolar static induction transistor -- a gate, a source and a channel -- on one of the sides of the substrate, and elements of a onejunction transistor -- an emitter and a base (drain) -- on the other [3]. This transistor has high current density and can switch high power. The drawback of the transistor is that it cannot operate on circuits of alternating voltage (to be more precise, it can be closed by applying only one of polarities of the drain-source voltage).

"paragraph 0003". There exists a bipolar transistor, which has structure actually comprising two bipolar transistors and which can operate in alternating-voltage circuit [4]. The drawback of the transistor is that it cannot has high technical characteristics. Its breakdown voltage, current density and switch power are low.

"between paragraph 0003 and 0004". There exists a vertical bidirectional MOS-type